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Leveraging Network Intelligence to Maximize Bandwidth and Revenue

By Jay Klein

A Complete View of the Network is the Key to Effectively Maximizing Bandwidth and Revenue

With the ever increasing diversity of data applications, bandwidth capacity is a major concern for both fixed and mobile service providers. The recent explosion of video and other bandwidth hungry applications, and their increased popularity on both fixed and mobile networks, has translated into a huge surge in the use of broadband. In addition, the introduction of smartphones, netbooks and USB dongles for laptops has meant that consumers can download, stream, browse, create and share content whenever and wherever they want. They are no longer chained to their PC for a rich application content with a correspondingly high quality of experience. All of this has resulted in increasing bandwidth demands and subsequent congestion. Furthermore, bandwidth hungry applications are negatively impacting subscriber quality of experience (QoE) and allowing a few subscribers to monopolize limited bandwidth resources.

Traditionally, service providers have attempted to solve this problem with a 'band-aid solution' that focuses on expanding their network infrastructure to increase capacity. This has been a costly, short-term and often ineffective approach as bandwidth intensive applications will always consume the maximum bandwidth available, and providers need to achieve low cost network efficiency as they fight to stay competitive. Bandwidth congestion and usage is a multi-faceted, complex issue, but the only realistic and practical way to resolve it is to focus on the underlying issues behind it. In order to

do this, service providers must have a comprehensive view of what is going on inside their networks. It is this visibility that facilitates a clear understanding of subscriber, application, and network topology behavior. It provides operators with the network intelligence not only to maximize bandwidth for operational use, but also to maximize bandwidth for revenue purposes by offering tiered services and increasing ARPU, and for an improved subscriber experience.

Harness Network Intelligence to Benefit the Network, the Provider and the Subscriber

In order to maximize the benefits of network intelligence, the business and operational needs of the network must be aligned with the needs of the subscribers. It may seem obvious, but in today's market where broadband is more accessible than ever, subscribers are often hard-pressed to understand the differences between provider offerings and competition comes from all quarters, operators need to make sure that their service portfolio is one step ahead of the game. This means that they must offer differentiated services that subscribers want and at a price they are willing to pay. They must also simultaneously guarantee a high quality of experience for subscribers particularly when dealing with delay-sensitive applications, and ensure the smooth operational running of the network. The key to doing this lies in the ability to answer a number of questions, the answers to which enable network intelligence to translate into invaluable business intelligence:

Some of the questions that need to be answered are:

- Can you build a model of different subscriber groups using your network? How do they behave on the network? Are they heavy users or light users? Do they behave differently when they move from a mobile to a fixed network?

- What are the applications being used? How often are they used and how much bandwidth do they consume? Which are the most popular applications? Are certain applications more popular in certain geographical regions?

- How are subscribers accessing the network? Are they accessing the network using a fixed workstation or a mobile device? Are they using a smartphone, a netbook or a USB dongle?

- When are subscribers using the network? When are their peak hours? What are the network congestion levels during those hours?

- In today's wireless world, where are the subscribers geographically situated when they use the network? What areas are inadequately served by the existing infrastructure? Which areas should be prioritized for investment and a bandwidth upgrade?

Vital to network intelligence are a range of technologies and solutions from deep packet inspection (DPI) to policy control and enforcement, from media caching to traffic anomaly detection. The need for these technologies has been exacerbated by the recent explosion of video and other bandwidth intensive applications as mentioned previously, as well as increasingly sophisticated security threats to the network. The result of implementing such technologies is the ability to gain a deeper

understanding of application, subscriber and network behavior coupled, more importantly, with the ability to act on that information and the subsequent ability to monetize the network and increase ARPU.

A perfect illustration of this is network topology awareness. For example within mobile networks, cell awareness technology can help operators monitor and manage the utilization of cell, cell sector, and cell backhaul resources with pinpoint accuracy. In practical terms cell awareness means that the operator, for example, will be able to find out that the recurring congestion on a particular cell uplink is being caused by a voracious BitTorrent user who is downloading several large video files, or a handful of mobile Slingbox users who are tuning into their local sports coverage. One solution would be to implement a fair-use traffic policy limiting all users to 600 Kbps that could be activated at peak hours, or triggered by congestion thresholds, or by subscriber behavior within the cell.

Other examples of leveraging network intelligence include the deployment of tiered and differentiated services. These can range from media caching which enables the provider to effectively monetize internet video by intelligently accelerating its delivery, to network security which intelligently provides real time elimination of network and subscriber originated attacks. Both these services improve the subscriber's internet experience immeasurably, increase ARPU and reduce customer churn. In addition, offering a range of basic and premium payment packages allows subscribers to feel more in control of their use and retain control of their expenses. It means that the couple who use broadband to access email and periodically browse the internet will not pay the same as the tech-savvy student who downloads music and video files 24/7.

Network Intelligence is Power

Bandwidth is expensive. Investment in infrastructure is the single largest investment that any operator makes, and consequently, it is essential that it is properly utilized. Ensuring the maximum return on investment requires a complete understanding of how the investment is being used, and in the case of bandwidth, how the applications that run over it and the subscribers that use it are behaving.

As we look towards the future it is clear that as fully converged networks steadily take root and become more mainstream, network intelligence will take on an increasingly business-critical role. Networks will typically be characterized by a greater than ever convergence of applications and services, which will offer the subscriber more choice and more control at the same time as making more demands on existing bandwidth. This knowledge will empower operators to make smarter and more cost effective decisions about investments in the network including the roll out of new services, capacity upgrades and more. It is only through network intelligence based on visibility and accurate information that operators will have a clear understanding of what is happening throughout their network, from an application, subscriber and topology perspective, and in turn, will be able to accurately and sufficiently maximize bandwidth to the benefit of the network, the operator and the subscriber.